

7-2012

Use of Learner-Centered Instructional Strategies in Higher Education: Doctoral Student Assessments

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Recommended Citation

Browne-Ferrigno, Tricia and Muth, Rodney (2012) "Use of Learner-Centered Instructional Strategies in Higher Education: Doctoral Student Assessments," *International Journal for the Scholarship of Teaching and Learning*: Vol. 6: No. 2, Article 23.

Available at: <https://doi.org/10.20429/ijstl.2012.060223>

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Keywords

Doctoral education, Learner-centered instructional strategies, Adult learners, Cohorts, Doctoral dissertation, Companion dissertation, Collaborative research

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Abstract

Based on multiple sources, this article concludes that, when learner-centered instructional strategies are used with doctoral students, these adult learners take charge of their individual and collective learning, become accountable for both, and enhance their ability to transfer learning to practice. The students studied skills of developed teams in advance of their group-conducted dissertation research first by engaging in team-development activities, then by conducting group-constructed pilot studies, and finally by collaboratively authoring related conference papers. These student-centered activities sought to ensure that the doctoral students could work together to conduct and complete their degree-ending, team-conducted dissertation research.

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Introduction

Programs leading to the Doctor of Education (EdD) and Doctor of Philosophy (PhD) degrees have received considerable attention by The Carnegie Foundation for the Advancement of Teaching (Golde & Walker, 2006; Wasley, 2007). In particular, the Carnegie Project on the Education Doctorate (CPED) focuses on “developing *stewards of practice*” (Perry & Imig, 2008, p. 44) through EdD programs uniquely different from traditional PhD programs that prepare researchers (Schulman, Golde, Bueschel, & Garabedian, 2006). To achieve such differentiation, revitalized EdD programs should evidence changes in scope and sequence of curricula, new knowledge bases and signature pedagogies, and research methods appropriate for practitioner scholars (Guthrie, 2009; Loss, 2009). Because such programs are intended for practitioners who are employed full-time (Perry & Imig, 2008), typically they are delivered through executive, cohort-based models that are fast-paced, problem-oriented, and applied. Even so, research is needed on whether program modifications of instructional strategies affect student-learning experiences and outcomes.

As veteran doctoral instructors, we strongly suggest that adult-learning-oriented programs will benefit EdD faculty and students alike. That is, programs that implement learner-

centered instructional strategies recognize the essential role of adults in their own learning, focus consciously on knowledge retention and use, and engage and empower students (Danzig, Blankson, & Kiltz, 2007). Faculty benefit because students take ownership of and responsibility for their own learning, thus changing faculty roles from center stage to facilitators and coaches of learning (Danzig, Chen, & Spencer, 2007). Students benefit because they learn better and faster, retain and use knowledge and skills more ably, and transfer both knowledge and skills gained to their work environments but also alter their own instructional expectations and practices (Bransford, Brown, & Cocking, 2000). Such strategies are particularly important when EdD programs are delivered in a hybrid or blended model that utilizes online learning to supplement face-to-face class sessions (Martyn, 2003). Further, students in learning-centered programs are much more likely to complete their programs (Barnett & Muth, 2008; Browne-Ferrigno & Jensen, in press).

Study Purpose and Data Sources

The question here is whether assessments by higher-education practitioners of their learner-centered learning opportunities indicate that learner-centered instructional strategies have the desired impact. This study took place in a recently designed, CPED-affiliated EdD program to prepare leaders for a statewide system of community and technical colleges. The students in the program began their coursework in a closed cohort (Barnett, Basom, Yerkes, & Norris, 2000); student-initiated withdrawals were the only changes in the cohort. Because the program features unique "companion dissertations" (McNamara, Lara-Alecio, Irby, Hoyle, & Tong, 2007, p. 1), small-group and team-development activities were initiated during the first semester of coursework and continued throughout subsequent semesters. These team-building exercises sought to ensure that students could work together effectively on the required culminating, collaborative-research projects.

While the program design had particular objectives, it appeared best that assessments of cohort members' experiences come from the students themselves. Thus, we used two data sources: (a) students' reflections about learning activities and outcomes gathered through post-assignment Web-based surveys and (b) their group-authored papers for a conference in which they described program elements and examined how those elements affected their learning. Web-based surveys were developed and administered by the first author, an instructor for four courses in the EdD program, to assess impact of the diverse instructional strategies and group-based assignments on student learning. Although commentary generated through administration of the surveys cannot be linked to specific individuals, member checking of this article by doctoral candidates provided quality assurance.

The data sources used in this article were generated by students participating in the first cohort of a new, CPED-affiliated EdD program at the host institution. Although the college of education has awarded the EdD degree for over 50 years, this new program was the first to require students to work as research-team members to complete companion dissertations. This unique feature makes it very difficult if not impossible at this time to compare findings about this program with results for any other programs.

From Cohort to Generative Learning Community

Closed cohorts in leadership-preparation programs are recommended because all students stay together during an entire program of study, enhancing the professional learning and skill development of participants (Barnett et al., 2000; Hebert & Reynolds, 1998; Peel, Wallace, Buckner, Wrenn, & Evans, 1998). A closed-cohort structure provides continuity and opportunities for aspiring and experienced leaders to learn and practice skills in group goal setting, community building, conflict resolution, and culture management (Browne-Ferrigno & Muth, 2003; Muth, 2000, 2002). This structure also supports implementation of long-term developmental activities and point-counterpoint discussions (Cordiero, Boutilier, Panicek, & Salamone-Consoli, 1993; Guzmán & Muth, 1999) that are exceedingly difficult to integrate effectively across individual courses over time.

Generative Learning Communities

Successful closed cohorts become “generative learning communities” (Browne-Ferrigno & Muth, 2008, p. 78) that have the same three fundamental elements of communities of practice: “a *domain* of knowledge, which defines a set of issues; a *community* of people who care about this domain; and the shared *practice* that they are developing to be effective in their domain” (Wenger, McDermott, & Snyder, 2002, p. 27). Communities of practice evolve over time as their participants develop expertise through shared learning and knowledge refinement “out of the raw material of [members’] experiences” (Drath & Palus, 1994, p. 3). Thus, participation in a community of practice can expand one’s opportunities for professional growth and career advancement through sharing of expertise and development of collegial relationships. Closed cohorts, functioning as generative learning communities, likewise set the stage for situated-learning opportunities (Lave & Wenger, 1991; Wenger, 1998) in which novices and experts can apply theories to practice and develop needed skills. Generative learning communities do not simply happen: They are carefully constructed, consciously nurtured over time, and collaboratively maintained and transformed through the collective efforts of all involved.

Leadership-Development Practices

The intent of leadership preparation is “to produce leaders” (Milstein, 1992, p. 10) who have the requisite knowledge, dispositions, and skills to lead organizations competently and effectively. Successful programs focus on the self-transformation of participants, a process that requires changes in their professional culture (e.g., language, perspectives, and skills) and that alters their conceptual, personal, and educational orientations (Browne-Ferrigno & Muth, 2004). This transformative learning requires adult learners to develop new frames of reference encompassing “*habits of mind* and a *point of view*” (Mezirow, 1997, p. 5) that help them become autonomous critical thinkers. Transformative learning occurs through (a) articulating one’s assumptions, (b) assessing them critically through self-reflection and discourse with others, (c) revising them to accommodate new perspectives, and (d) behaving in ways congruent with the revisions. New habits of thinking and behaving also can be stimulated through examining *critical life events* experienced by adult learners or through *activating events* intentionally introduced into a learning environment to stimulate discussion and debate (Cranton, 2002; Hansman, 2001; Schmitt & Perl, 2007).

Learner-Centered Instructional Approaches

As adults gain confidence as self-organizing learners, they engage in educational activities that improve their knowledge and skills, eschewing activities viewed as nonessential or inconsequential to their needs and seeking to learn about ways to address societal issues

and to apply their new knowledge immediately (Bridges & Hallinger, 1997a, 1997b; Dunlap, 2006). Although most adult students prefer problem-centered learning to accomplish these ends (Cross, 1981; Knowles, Holton, & Swanson, 2007; Merriam, Caffarella, & Baumgartner, 2007), some do not because they are well acclimated to past learning paradigms (Grabinger, Dunlap, & Duffield, 1997; Phillips, 2000). Even so, learning environments that are accepting, respectful, and supportive of adult students' beliefs, expertise, and needs (Bransford et al., 2000; McCombs, 1991) can produce learning outcomes that transfer to practice.

Learner-centered or transformative-learning approaches require students to accept responsibility for "their own development through self-managed learning" and to be "actively involved in the development of their classmates" (Foreman & Johnston, 1999, p. 377). Moreover, problem- or project-based adult learning programs (Bridges & Hallinger, 1997a; Martin, Murphy, & Muth, 1993; Savery & Duffy, 1995; Wolk, 1994) support these principles and processes by helping students focus on applications and change-oriented outcomes. Finally, adult learners in educational-leadership programs, regardless of level, will throughout their careers work with and through adults to create change in educational environments. Learning how to learn as adults can help such leaders develop respectful and useful learning-centered, adult-oriented professional development (Danzig, Blankson et al., 2007; Danzig, Chen et al., 2007; Grogan & Andrews, 2002) for those whom they expect to lead in the future.

Preparing Community and Technical College Leaders

To incorporate significant elements of adult, problem-oriented learning-centered instruction according to the sections above, a cohort-based EdD program using a hybrid model of online learning activities and monthly face-to-face meetings was launched Fall 2007. The program involved a partnership between two departments within the host university's college of education and the administrative office of the statewide system of community and technical colleges. Program faculty from the university, representatives of the community and technical college system office, and adjunct faculty with experience in two- and four-year institutions collaboratively developed the curriculum. Five themes (innovation and change within institutions, community and technical college issues, postsecondary curriculum, effective leadership, diversity and social justice) framed the program of studies. In addition, four major constructs (two-year colleges within the P-20 education landscape, organizational practice, learning and teaching, applied research and decision analysis) guided curriculum development.

Program Curriculum and Learning Events

At the beginning of the program, teaching philosophies are shared with students so that they can understand, debate, and assimilate the intent of the professors and their expectations for student learning and student-centered practices. For example, one professor indicates in her syllabus, "My role as course instructor is to facilitate, guide, and support learning." Additionally, she asserts,

My responsibility as course instructor is to provide the means through which dynamic learning environments can be developed. All individuals participating in course learning activities are responsible for the creation and maintenance of dynamic learning environments.

And she concludes in her learning-teaching philosophy published in her syllabus, “I commit to providing guidance, support, and critical feedback to help my students achieve course objectives and to facilitate their professional growth—as well as mine—as educational leaders.” By making expectations explicit, this instructor provides the foundations for open discussions about learning and teaching, responsibilities for learning, and the importance of building learning environments that are student centered.

During the first three years of the program, students completed the required 15 courses with content emphasis spanning foundations (first year), organizational leadership and academic practices (second year), and applications to practice (third year). Cohort participants, course instructors, and the program director met face-to-face five times each fall and spring semester for two consecutive days (Friday afternoon and evening, Saturday morning and afternoon), typically in meeting rooms at the community-college system-headquarters building. At least once each academic semester, a Friday-night doctoral seminar was conducted at the university campus so that the EdD cohort participants could interact with other university faculty. During the first semester of the program, cohort participants attended the 2007 annual meeting of the Association for the Study of Higher Education in Louisville, Kentucky, where they had opportunities to meet and talk with leading community-college scholars. During their third year of studies, the students presented group-authored papers at the 2009 annual meeting of the Southern Regional Council on Educational Administration in Atlanta, Georgia.

Learning Cohort

Due to the program’s intentional focus on two-year colleges, admissions were limited to personnel working at the system office or its member colleges. The original cohort membership of 28 students dropped to 22 at the beginning of second semester; those withdrawing cited personal or pedagogical reasons for leaving. The group that completed all coursework included 10 men and 12 women employed as administrators, faculty, or professional staff at 13 of the 16 colleges as well as the system office. Prior to taking their qualifying examinations, 4 of the 22 cohort members opted to complete their dissertations as sole researchers rather than as group members. At this writing, 14 cohort participants have successfully defended their group dissertations and been awarded EdD degrees; the remaining 4 cohort members working as a team are drafting the final chapters of their dissertations, which they plan to defend together in early fall of 2012. The research foci of the five self-selected dissertation teams are transfer credit, online learning, student progression through community college, dual credit through middle college high schools, and organizational excellence.

Student Assessments of Learner-Centered Strategies

During the first semester of the program, cohort members were required, for example, to participate in online discussions through Blackboard in which they reviewed and critiqued their peers’ reflections on course content. Students were formed into four and then six randomly assigned small groups and were required to work with their group members during monthly face-to-face meetings. Online, they communicated with their peers via group discussion boards in Blackboard to complete two collaboratively developed papers (an abstract of an assigned research-based article and an outline for a research proposal).

At the beginning of the second semester, students responded to a Web-based questionnaire in which they assessed their groups' performance during the first semester with regard to assigned readings about high-performing work teams. Cohort participants reported that "the process [during the first semester] seemed very disjointed" and that some groups "never formally assigned specific authority within the group as it pertains to tasks or timetables." According to one respondent, "Our team never discussed . . . individual accountability. Therefore, no penalties were decided or discussed for those [who] did not complete their respective tasks . . . [which] were not assigned. Overall, our team performance was not satisfactory."

As indicated by some respondents, these first efforts at collaborative work were challenging because they were accustomed to collaborating in "physical environments," not virtual ones across time zones. They "thought in terms of fairly immediate feedback," rather than "asynchronous discussions in Blackboard," and thus did not consider "how other team members used technology in responding." Although many cohort participants used Blackboard and other online platforms in their professional practices as community-college instructors, they had only experienced the process as instructors, not learners. Thus, some "lacked the understanding of how to accomplish the task" using information technology.

These early small-group projects also generated conflict because the groups failed to articulate group-member responsibilities, share responsibility for completing tasks, or even make efforts to get to know one another. This was troubling to some cohort members.

The first group [to] which I was assigned was recognized by both group members and observers as spending a great deal of time "storming". . . . I have been a member of many groups in the past, but this was by far the most difficult in which to work. . . . Our team had no management or leadership.

Although most groups "followed instructions" and some "produced a great final product," it became evident to everyone that more intentional efforts were needed to develop strong groups that could work together to produce quality experiences and products.

Assuming Responsibility for Individual and Collective Learning

During the second semester, students took the first of a two-course series on leadership in educational organizations. Content focused on multiple organizational realities, first from contemporary perspectives by viewing organizations through four frames (Bolman & Deal, 2003) and then from classical perspectives that emphasize rational, natural, and open-systems theories (Scott & Davis, 2006; Shafritz, Ott, & Jang, 2004). Readings about high-performing teams (Harvard Business School Press, 2006) were integrated into the course to address group-development needs and rectify the insufficient earlier attention to this essential foundation.

Using students' results from the StrengthsFinder inventory (Rath & Conchie, 2008) to develop six teams, the instructor balanced representation across four leadership domains (executing, influencing, building relationships, thinking strategically). Students remained in these teams throughout Spring 2008, during which two major assignments were assessed. The rubrics used were initially drafted by the teams and then codified collaboratively by the entire cohort. Team members received the same grade for their work based on their team's overall performance, assessed by the cohort-developed rubrics.

The teams' first task was to work collaboratively to develop norms for completing two group presentations. All decision making about group structure and processes was left to the discretion of each team. The intent of these group-development assignments was for cohort participants to learn individually and collectively how to become and work successfully in high-performing teams (Laiken, 1998). An online questionnaire administered six weeks after the semester began yielded student responses to this initial team-building assignment. As Table 1 indicates, most students (17 of 22) felt strongly that the teams addressed necessary tasks, had prerequisite skill sets, developed achievable goals, evolved sound working relationships, held one another accountable for roles and responsibilities, and created structures and appropriate tasks.

Table 1. Student Perceptions of Team-Building Activity

Assessment Criterion	Strongly Disagree	Disagree	Agree	Strongly Agree	Rating Average
Team had clear authority to complete assigned task	0%	0%	12.5%	87.5%	3.88
Team composition was right mix of expertise	0%	0%	45.8%	54.2%	3.54
Team recast task into measurable goals	0%	4.24%	37.5%	58.3%	3.54
Team developed common commitment to working relationships	0%	0%	25%	75%	3.75
Team members held themselves collectively accountable for final product	0%	0%	29.2%	70.8%	3.71
Specific team roles were discussed	0%	8.3%	33.3%	58.3%	3.50
Specific team roles were developed	4.2%	8.3%	29.2%	58.3%	3.42
Team developed structure adaptable to future tasks	0%	4.3%	25%	70.8%	3.67

Commentary generated through open-response prompts on the same survey provided further evidence that cohort participants assumed greater responsibility for their individual and collective learning. The first prompt asked, *What was the most important lesson you learned by completing this assignment?* Throughout the responses were revelations such as "effectiveness can be improved by some thoughtful, intentional discussion before launching out toward goal" and developing "agreed-upon norms" can add "clarity and conciseness" to the process. One participant wrote,

I learned . . . how to start the work of forming a team. . . . It is one thing to read about a concept, but to actually be forced to engage with the process takes it to a whole new learning experience.

A peer reported using "the experience and the readings to form teams at work" and changing "some ways that I engage others" as a result of the class activity. Another cohort member wrote that the assignment

required our group to discuss some ground rules and guidelines. The activity itself opened up lines of communication, which is crucial in any group activity, particularly one in which most of the interaction is done via technology. . . . The important thing is for everyone (including myself) to be aware that we may not agree on all aspects of what we are doing as a group and that is okay. As long as we are open and respectful in our communication, we will be a productive group.

The other open-response prompt asked, *If your identity was not disclosed to your fellow teammates, what concern(s) would you share with them?* Although most responses suggested a sense of shared responsibility for learning among the cohort, some interesting thinking emerged: "My biggest concern is my sense of personal responsibility. What I do impacts not just my grade but potentially that of others. . . . As a team member, I have a responsibility to others."

Differences in orientation to completing the assigned task (e.g., process versus product) appeared in other responses: "compromise is not always a bad thing" and "there are problems with moving too quickly and thinking too little." One participant indicated, "I think we were a little more concerned with expediency than the actual content of our product. We probably should have spent a little more time getting to know one another and discussing strengths and weaknesses." Another cohort member asserted that "one day I may have to have a [private conversation] with someone who is not performing or carrying out his share of the work load." Conversely, a cohort peer asserted a preference to address "concerns in an open format."

During the face-to-face cohort meeting immediately following administration of this online survey, a copy of the results was distributed to each student. Time was allocated for teams to review and discuss the anonymous results. Several teams modified their group norms to address concerns that became evident through survey responses and team conversations. For two students, this activity—intended to build capacity for the cohort to complete group dissertations—made it clear that this program was not for them. Because they did not enjoy working collaboratively on class projects or course assignments, they withdrew from the program the following week.

Preparing for the Group Dissertation

By Spring 2009, cohort members had independently drafted two research proposals. Based on the instructional plan, it was time for them to work in teams to design and conduct an authentic pilot study as practice for the required group dissertation. Students formed into five self-selected teams composed of three to four participants each. The only requirements for the pilot study were that (a) the research topic would relate to student services in two-year colleges, (b) the Rapid Assessment Process (RAP) (Beebe, 2001) would be utilized for data collection and analysis, and (c) each team would present study findings during the last face-to-face cohort meeting of the semester. The deadline for submission of the final report gave students time following their formal presentations to make needed revisions prior to submission for grading.

An online survey about the pilot study was administered immediately after the deadline for submitting team reports. The first 20 questions were about the teams' inquiry projects, specifically distribution of responsibilities for organizing the project, data collection, data analysis, report writing, report editing, and PowerPoint-slide preparation for the formal presentation. The discussion that follows is based on responses to the open-response

prompt that asked, *What important lesson(s) did you learn about working as an inquiry team?*

Because the pilot study was the first research project conducted by many cohort participants, their comments reflected their perceptions that research “is hard work,” that it “takes a lot of planning to get everything going well,” and that “more thought needs to go into the question and entire protocol process.” Apparently, one was surprised that “qualitative analysis is very rewarding,” while another was pleased that “information could be gathered quickly using RAP.” One cohort participant learned the importance of planning ahead:

Setting norms and a timeline for components of the projects are crucial in setting precedence from beginning to the end of the project. . . . [and] to have backup plans because things do not always happen the way it is initially planned.

Another likewise commented on the significance of planning:

We did a lot of storming, and that cost us at least a week, placing greater pressure on time later in the project. I learned that a storming team can also be productive and work together professionally despite differences in style and, to some extent, ethos. I also learned the importance of having agreements in advance on what the responsibilities are and having norms in place to handle times when team members cannot meet their deadlines.

The “need for carefully coordinated schedules with clearly identified responsibilities and expectations for each team member” was another lesson learned.

Conducting the team-based pilot study appeared to generate confidence in some cohort members about their ability to complete successfully the required group dissertation:

I think the biggest lesson for me was to see everything from two years come together in a better understanding of what would occur during an actual research report. I was able to work with some members that I [had] reservations about.

A peer reported similarly, “If this experience is anything like the group dissertation, it will be an incredible experience. I thoroughly enjoyed the process and the team. Each of us brought a totally different perspective which provided a richer analysis.”

Becoming a Generative Learning Community

During Fall 2009, students in the cohort presented four group-authored papers at a regional conference about their experiences as participants in this EdD cohort. Topics included (a) an overall assessment of the program elements, (b) stages of group development experienced by the cohort, (c) ways of balancing personal and professional responsibilities, and (d) application of learning to leadership practice. Two groups administered online surveys to complete their papers; the two other groups reviewed course-produced documents and presented authors’ professional reflections. The quoted material in the following sections is from those group-authored conference papers.

Persistence through Peer Support

Adult students often experience major personal or professional events that can adversely affect their continuation in graduate studies (e.g., birth of children or grandchildren, illness or death of loved one, marriage or divorce, professional promotion or new assignment, changes in work environment). Two-thirds of the cohort members experienced such events, yet it appears that those changes actually strengthened the cohort:

A culture of group survival has emerged through a thoughtful and understanding learning environment. Sharing responsibilities allowed for a stronger cohort to be developed and has sustained the cohort as a whole. In fact it appears from our analysis of the survey data [we collected] that, in many instances, the life-changing events actually created greater appreciation of other cohort members. Our cohort as a whole is more socially engaged after class; as time progresses, the social aspect of the cohort continues to evolve. (Decker, Dykes, Gilliam, & Marrs, 2009, p. 7)

Although group-development activities were integrated into the curriculum, the relationship building needed to create a "culture of group survival" may have resulted from a program-design element: Monthly two-day meetings required most cohort participants to travel significant distances to attend.

Because we are away from families, friends, and work environments during face-to-face sessions, we are able to reconnect with our cohort peers in ways that are not possible in traditional doctoral programs delivered through weekly on-campus classes. Through this relationship building, [we] have begun to care about one another. . . . The support and care shown [peers during challenging-life events] have been touching to watch and experience. (Berry, Blankenship, Bolt, & Phillips, 2009, p. 6)

Perhaps most important for student persistence in the program was the fact that the cohort experience "created such a supportive environment that many members who were inclined to withdraw remained [in the program] after conferring with other cohort members and faculty" (Berry et al., 2009, p. 14). This statement aligns with another group's assessment: "Most respondents identified support, encouragement, and feelings of value from their other cohort members as reasons for survival" (Decker et al., 2009, p. 6).

Adoption of Learner-Centered Strategies

Transforming the cohort into a generative learning community required considerable relationship building, particularly during the early months of the program when students experienced repeated cycles of forming and storming among themselves. According to cohort members authoring a conference paper,

Our first groups were formed by program faculty and given a specific charge with some group-building exercises added to the assignment. We worked out systems of contacting each other, drafted a set of norms, and tried to set deadlines and responsibilities. We thought, however, that the point of the exercise was to get the job done, thus not understanding the real intent was to engage us in the group-forming process. Many cohort members viewed the program and team exercises as a major shift from our typical roles and individual experiences. (Burke, Preston, Quillen, Roe, & Strong, 2009, p. 4)

The shift in expectations frustrated several cohort members, fueling additional conflict in some instances. Rather than serve as mediators, instructors let students resolve differences among themselves.

This forced us to think outside of our deeply held opinions and move to a broader framework of reference in various academic areas . . . [which] allowed us to appreciate and value others' ideas and perceptions instead of keeping a one-minded opinion. (Burke et al., 2009, p. 5)

Another shift in expectations was the requirement to serve as critical friends (Costa & Kallick, 1993; Handal, 1999). To develop this skill, the students reviewed and provided feedback on course papers, online discussion postings, and class assignments.

When the program began, feedback was more polite and less constructive in nature. As the program continued and the cohort evolved, peer review and feedback that is more constructive, assertive, and useful has emerged and proved to be invaluable in our individual and collective learning. . . . As a result, more complex and meaningful discussion has occurred that promotes an environment of learning and growth. (Berry et al., 2009, p. 7)

Over time, the EdD students realized that "each member of the cohort had to become an active participant in [her or his] learning" and "assume collective responsibility for our learning" (Burke et al., 2009, p. 7). Further evidence of cohort members' adoption of learner-centered strategies is that some reported "teaching hybrid classes, using technology to design group projects in their courses, and utilizing their better understanding of student-centered learning in their classrooms" (Berry et al., 2009, p. 15).

Transformative Learning

Professional reflection was required in all courses, most often through online postings or in-class discussions. The major writing assignment in the first leadership-oriented course required students to reflect critically about an organizational event or situation that was personally significant or challenging and that related to their current practice as an employee within a community or technical college. They had to describe what happened and then analyze the event using Bolman and Deal's (2003) four organizational frames. This independent assignment was particularly enlightening—and challenging—for five women in the cohort who had been promoted to administrative positions at their colleges "with limited or no leadership training" (Hlinka, Mayo, Mobelini, Stephenson, & Young, 2009, p. 1). Their conference paper presented summaries of their cases and closed with this statement:

The case study reflections exemplify our common experiences of having had blinders removed. As a result of our doctoral studies . . . , each of us has become more aware and appreciative of the subtle impact individuals have on an organization. . . . Reflective thinking is the basis for transformative learning, which requires the adoption of new frames of reference that become habitual and intuitive perspectives for analyzing dilemmas, developing alternative solutions, and choosing the best option. (p. 14)

Discussion, Implications, and Recommendations

As noted in our introduction, some EdD programs are in the midst of significant transformation. The program featured here demonstrates possible pathways to making the often radical changes necessary for doctoral education to push past traditional expectations and boundaries. The evidence of this single case adds importantly to findings about the impact of thoughtful programmatic changes on student-learning, students' roles in their own learning and their recognition of its importance to doing collaborative work, and the roles of faculty as they move—not without trepidation or halting steps—from traditional to student-centered, problem-oriented instructional paradigms (cf. Muth, 2002).

Focusing on Learner-Centered Instructional Strategies

The history of most student experiences in college, in graduate school, and in professional development is rife with *sit and git* (Lambert, 1998) learning and *sage on the stage* (Cifuentes, 1997) teaching. Such traditional formats for knowledge dissemination and assessment fall seriously short of engaging students in developing, assessing, and growing their own knowledge and professional skills, particularly those needed to accomplish tasks successfully in their professional practices. This is especially applicable for participants in the featured EdD program who are themselves adult educators responsible for ensuring that their adult students in two-year colleges are challenged to take responsibility for their own learning. Based on some commentary from EdD program participants, their learning from various cohort experiences informed their teaching and professional practices.

Further, the program design—albeit slow to develop in some ways—had the desired and intended effects, both building active engagement in generative learning communities and developing individual and group confidence about leadership and research readiness through specific practice applications. For example, in response to one survey prompt asking if the program needed to be changed to improve opportunities for learning, one cohort participant wrote,

I appreciate the effort to tie assignments to our jobs and daily lives, making the material and work as relevant as possible. I am a hands-on learner, so when I am able to apply the material, I am better able to retain it.

Another participant responded,

The program is evolving in good ways . . . assignments are amazing for their clarity of objectives, quality of evaluation, and integration of the total class experience and content. None of my grad school profs [in the past] were that engaged, and I feel cheated by that.

Another student appreciated “the adaptations and the flexibility that [instructors] have already provided to us” and asked “that this continues if needed.”

Further, students reported developing group-process skills necessary to support their group-dissertation efforts. Recall that the two instructors during Spring 2009 designed a pilot study that served as the major assignment for both courses. After the close of the semester, a Web-based survey prompt asked students to reflect on their preparation for conducting a group dissertation. Student commentary demonstrated the value added of learner-centered strategies and authentic projects:

You have to understand the strengths of your team members and use those to work smarter and more efficiently. Working as a team can be difficult, especially when everyone has outside professional and personal responsibilities. The scheduling itself can be a huge challenge . . . [but] the advantages outweigh the challenges.

Another cohort participant appreciated that team peers “brought completely different expertise and skills” that contributed to their collective success in completing the pilot study. Further, the group “established team norms” that assured “everyone met deadlines and responsibilities.”

These outcomes resulted from intentional efforts by faculty to create authentic experiences that transferred responsibility for learning success to students. Further, students accepted responsibility, both individual and collective, to complete the assigned tasks to the benefit of the group and the individuals who composed it. Cohort members who have completed their group dissertations and those still actively engaged in their dissertation research have shared with EdD faculty that learner-centered instructional strategies were critical to their success.

Helping Students Assume Responsibility for Learning

When graduate students experience the freedom that comes with assuming responsibilities for their own and their colleagues’ learning, their sense of empowerment is palpable. Recall the words of one cohort participant about debriefing the outcome of a group project during the early weeks of the second semester of the program: The assignment “required our group to discuss some ground rules and guidelines. The activity itself opened up lines of communication, which is critical in any group activity, particularly one in which most of the interaction is done via technology.”

Reaching this point, however, required energetic faculty commitment to create rich learning environments and experiences (Grabinger et al., 1997) that encourage and support students to take charge of their own learning and become responsible for group-developed outcomes. This is not easy. Such tasks are risky and require veteran professors to relinquish considerable autonomy as instructors, develop new skills required for distance learning, and help students take responsibility for their own learning. Each of these demands require faculty to assume responsibility for the assessment of learning (Barnett & Muth, 2001)—typically monitoring the developmental tasks, developing untypical assignments, backing them with clear rubrics, and assessing student responses to learning expectations in productive ways. Such critically powerful processes both help direct learning and provide reliable, useful, and timely feedback to learners. They also require instructors to make necessary modifications in their own practices so that learner needs are addressed foremost.

Building Readiness for Collaborative Projects

Table 2 shows examples of how faculty and students might prepare for creating self-organizing group projects. If students are expected to work together toward common goals, then given how students typically have learned (individually and competitively), new skill sets need to be developed to support collective, collaborative work focused first on learning outcomes and accomplishments and last on individual grades. Such responsibilities fall directly to faculty to create the environments, the learning opportunities and activities, and the expectations that initiate and support collaborative cultures, generative learning, and the skill building essential to accomplishing effective group research. For other examples of

roles and responsibilities in adult learning and professional preparation, see Muth (2000, 2002) and Muth et al. (2001).

Table 2. An Example of Faculty and Student Developmental Responsibilities

Developmental Elements	Faculty Responsibilities	Student Responsibilities
Building Relationships	Establish successively complex, small-group, skill-building exercises	Assess interpersonal skills Engage actively with peers Strengthen group skills
Building Teams	Generate exercises that necessitate interdependent work	Engage actively with peers Provide peer support Assess individual and group outcomes
Solving Problems	Define research problems that are amenable to collaborative group work	Collaborate and assist peers Develop problem-solving skills Assess individual and group contributions and outcomes

To reach the end-point knowledge and skills necessary to build effective student teams requires careful scaffolding. Over time, knowledge and skill blocks need to be developed that lead to preferred learning outcomes, about which program developers and implementers must be crystal clear. Effective teams work collaboratively, accept individual responsibility for group outcomes, and provide timely evaluative feedback such that team members can stay on task, on track, and correct their collective processes as needed (Harvard Business School Press, 1998; Laiken, 1998). Each of these elements can be developed in increasingly more complex tasks according to Table 2. Yet, because such building blocks come together over time—not simply during one course or one semester—intense collaboration among faculty within and across courses is indispensable.

Utilizing Learner-Centered Instructional Strategies

Faculty can learn to collaborate with one another and model the very behaviors expected of students. Most have accomplished this in other roles in education and in research roles with colleagues. Whether faculty transformation begins with their own research practices or with developing new programs or revising old ones, the same performance expectations that they hold for themselves and their faculty colleagues can form the bases for the learning opportunities of graduate students.

Because not all students can work effectively collaboratively, as evidenced by cohort members who self-selected out of the EdD program and demonstrated by group-conducted dissertations, faculty should decide if this is acceptable. If not, then criteria for recruiting students need to be developed to increase the probability that every program participant can and will actively and successfully engage in collaborative group projects. Because recruitment and selection of program participants can be critical to program success—or failure—program expectations for collaboration should be available to prospective applicants so that they can make informed decisions about program suitability for them.

One way to increase the likelihood that learner-centered instructional strategies will work well is to develop strong, mutually supportive university-field partnerships. By building intense relations with area, regional, or statewide constituents, a practice-oriented program can develop practice sites that provide complex problems of practice for student groups to examine, evaluate, and resolve. Resulting problem solutions can be meaningful, useful, and productive for field partners as well as relevant for all involved and for the broader field of practice. Each opportunity provided for collaborative learning programmatically can lead to additional possibilities in cohort members' home settings, perhaps changing how work is accomplished there as well.

Lessons Learned

Although we both have successfully utilized learner-centered instructional strategies in our practices as graduate faculty, we have also experienced resistance from our colleagues as Weimer (2002) warns can happen. The necessary transfer of power and authority for learning from instructor to students can be "enormously threatening" (p. 162) to some professors. For example, relinquishing control over class discussions and learning activities requires not only content expertise but also pedagogical expertise—typically gained through trial and error over time. The inherent risk of failure and potential for low teaching evaluations from students not willing to assume responsibility for their learning can frustrate or block innovation. Likewise, utilizing learner-centered instruction changes a professor's role from being "the center of the action in the classroom" (p. 78) to being a learning facilitator, guide, and coach. Some professors are simply unwilling to assume these new and often difficult roles.

As veteran instructors in partnership-based leadership preparation programs, we engaged with university colleagues and P-12 practitioners in developing curricula, lesson plans, and learning assessments. Our fellow team members, often unfamiliar with learner-centered instructional strategies, had opportunities to observe us facilitating classes and then debrief with us afterwards about what they observed. As their confidence grew, they practiced using learner-centered strategies and afterwards reflected with us about what worked and what did not. Our team-teaching and debriefing cycles thus served as a developmental process for preparing graduate faculty to overcome challenges inherent to facilitating learner-centered classes.

The first author currently serves as the program chair for a recently state-approved teacher leadership program that requires co-teaching with P-12 practitioners. To assure implementation fidelity, the chair has scheduled regular faculty meetings with the program adjuncts to assist in updating course syllabi and designing new course assessments. She also invited adjuncts to observe and participate as a co-facilitator in her graduate courses in other programs. This investment in faculty development has resulted in more effective communication about curriculum, learning, and assessment; a shared commitment to sustain a community of practice; and commitment to model learner-centered instructional strategies for P-12 teachers.

The second author has spent more than 40 years creating graduate learning environments in which adult learners are enabled to consciously and actively take control of and become responsible for their own learning outcomes. While the evolution and progress from *sage on the stage* (Cifuentes, 1997) covering content to *coach and facilitator* (Danzig, Chen et al.,

2007) helping student struggle with problems of practice with problem- and project-oriented learning structures has been bumpy, the long-term rewards have been—more often than not—exhilarating for instructor and students alike. Not all students, however, have been willing accomplices, and many more have resisted changing traditional roles and expectations. Even so, creating learning environments in which instructors are co-learners, often on the same level with students given the learning problems of the moment, has provide both the opportunity to grow personally and professionally.

Unfortunately, the culture of higher education is glacial when it comes to changing its practices as anyone working on the scholarship of teaching and learning well knows. Nevertheless, as efforts like the one outlined here become more frequent and students graduating from such programs become advocates for such practices, the likelihood of widespread change increases significantly.

Note

The host university's institutional review board approved use of Ed.D. students' anonymous survey responses as exempt research.

References

- Barnett, B. G., Basom, M. R., Yerkes, D. M., & Norris, C. J. (2000). Cohorts in educational leadership programs: Benefits, difficulties, and the potential for developing school leaders. *Educational Administration Quarterly*, 36(2), 255–282.
- Barnett, B., & Muth, R. (2001, November). *Issues related to the assessment of cohort-based educational leadership preparation programs*. Paper presented at the annual meeting of the University Council for Educational Administration, Cincinnati, OH.
- Barnett, B. G., & Muth, R. (2008). Using action research strategies and cohort structures to ensure research competence for practitioner-scholar leaders. *Journal of Research on Leadership Education*, 3(1). Available at http://ucealee.squarespace.com/jrle_2008_3_1
- Beebe, J. (2001). *Rapid Assessment Process: An introduction*. Walnut Creek, CA: Altamira.
- Berry, S., Blankenship, P., Bolt, W., & Phillips, C. (2009, October). Innovative leadership preparation: What works and why. In T. Browne-Ferrigno (Chair), *Partnership cohort to prepare community college leaders: Participant perspectives*. Symposium at the annual meeting of the Southern Regional Council on Educational Administration, Atlanta, GA.
- Bolman, L. G., & Deal, T. E. (2003). *Reframing organizations: Artistry, choice, and leadership* (3rd ed.). San Francisco, CA: Jossey-Bass.

- Bransford, J., Brown, A., & Cocking, R. (Eds.). (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Bridges, E. M., & Hallinger, P. (1997a). Problem-based leadership development: Preparing educational leaders for changing times. *Journal of School Leadership*, 7(6), 592-608.
- Bridges, E. M., & Hallinger, P. (1997b). Using problem-based learning to prepare educational leaders. *Peabody Journal of Education*, 72(2), 131-146.
- Browne-Ferrigno, T., & Jensen, J. M. (in press). Preparing EdD students to conduct group dissertations. *Innovative Higher Education*, 37(5).
- Browne-Ferrigno, T., & Muth, R. (2003). Effects of cohorts on learners. *Journal of School Leadership*, 13(6), 621-643.
- Browne-Ferrigno, T., & Muth, R. (2004). Leadership mentoring in clinical practice: Role socialization, professional development, and capacity building. *Educational Administration Quarterly*, 40(4), 468-494.
- Browne-Ferrigno, T., & Muth, R. (2008). Generative learning communities: Preparing leaders for authentic practice. In R. Papa, C. Achilles, & B. Alford (Eds.), *Leadership on the frontlines: Changes in preparation and practice* (pp. 73-86). Sixteenth Annual Yearbook of the National Council of Professors of Educational Administration. Lancaster, PA: Pro>Active.
- Burke, L., Jr., Preston, N., Quillen, M., Roe, R., & Strong, E. (2009, October). Stages of group development: From strangers to partners. In T. Browne-Ferrigno (Chair), *Partnership cohort to prepare community college leaders: Participant perspectives*. Symposium at the annual meeting of the Southern Regional Council on Educational Administration, Atlanta, GA.
- Cifuentes, L. (1997). From sages to guides: A professional development study. *Journal of Technology and Teacher Education*, 5(1), 67-77.
- Cordiero, P., Boutilier, L., Panicek, J., & Salamone-Consoli, A. (1993, February). *The roles of practitioners, students and professors*. Paper presented at the annual conference of the American Association of School Administrators Conference-Within-a-Conference, Orlando, FL.
- Costa, A. L., & Kallick, B. (1993). Through the lens of a critical friend. *Educational Leadership*, 51(2), 49-51.
- Cranton, P. (2002, Spring). Teaching for transformation. *New Directions for Adult and Continuing Education*, 93, 63-71.
- Cross, K. P. (1981). *Adults as learners*. San Francisco, CA: Jossey-Bass.
- Danzig, A. B., Blankson, G., & Kiltz, G. (2007). A learner-centered approach to leadership preparation and professional development. In A. B. Danzig, K. M. Borman, B. A.

- Jones & W. F. Wright (Eds.), *Learner-centered leadership: Research, policy, and practice* (pp. 51–71). Mahwah, NJ: Lawrence Erlbaum.
- Danzig, A. B., Chen, R., & Spencer, D. A. (2007). Learner-centered leadership: Learning through mentoring, coaching, and professional development activities. In S. Donahoo & R. Hunter (Eds.), *Teaching leaders to lead teachers: Educational administration in the era of constant crisis* (pp. 23–41). Advances in Educational Administration, Vol. 10. Amsterdam, The Netherlands: Elsevier.
- Decker, A., Dykes, M., Gilliam, J., & Marrs, S. (2009, October). Being students again: Balancing ambiguities, expectations, and responsibilities. In T. Browne-Ferrigno (Chair), *Partnership cohort to prepare community college leaders: Participant perspectives*. Symposium at the annual meeting of the Southern Regional Council on Educational Administration, Atlanta, GA.
- Drath, W. H., & Paulus, C. J. (1994). *Making common sense: Leadership as meaning-making in a community of practice*. Greensboro, NC: Center for Creative Leadership.
- Dunlap, J. C. (2006). The effect of a problem-centered, enculturating experience on doctoral students' self-efficacy. *The Interdisciplinary Journal of Problem-Based Learning*, 1(2), 19–48.
- Foreman, J., & Johnston, T. (1999). Key aspects of teaching and learning in business and management studies. In H. Fry, S. Ketteridge, & S. Marshall (Eds.), *Handbook for teaching & learning in higher education: Enhancing academic practice* (pp. 372–390). London, England: Kogan Page.
- Golde, C. M., & Walker, G. E. (Eds.). (2006). *Envisioning the future of doctoral education: Preparing stewards of the discipline*. San Francisco, CA: Jossey-Bass.
- Grabinger, S., Dunlap, J. C., & Duffield, J. A. (1997). Rich environments for active learning in action: Problem-based learning. *Alt-J*, 5(2), 5–17.
- Grogan, M., & Andrews, R. (2002). Defining preparation and professional development for the future. *Educational Administration Quarterly*, 38(2), 233–256.
- Gutherie, J. W. (2009). The case for a modern Doctor of Education degree (Ed.D.): Multipurpose education doctorates no longer appropriate. *Peabody Journal of Education*, 84(1), 3–8.
- Guzmán, N., & Muth, R. (1999, Fall). Building blocks: Structures and processes for PhD student success. *Educational Leadership and Administration: Teaching and Program Development*, 11, 83–99.
- Handal, G. (1999, Fall). Consultation using critical friends. *New Directors for Teaching and Learning*, 79, 59–70.
- Hansman, C. A. (2001, Spring). Context-based adult learning. *New Directions for Adult and Continuing Education*, 89, 42–51.

- Harvard Business School Press. (2006). *Leading teams: Expert solutions to everyday challenges* [Pocket mentor series]. Boston, MA: Author.
- Hebert, F. T., & Reynolds, K. C. (1998). Learning achievements of students in cohort groups. *Journal of Continuing Higher Education*, 46(3), 34-43.
- Hlinka, K., Mayo, T., Mobelini, D., Stephenson, L., A& Young, A. (2009, October). Being and becoming leaders: Application of learning. In T. Browne-Ferrigno (Chair), *Partnership cohort to prepare community college leaders: Participant perspectives*. Symposium at the annual meeting of the Southern Regional Council on Educational Administration, Atlanta, GA.
- Knowles, M., Holton, E. F., III, & Swanson, R. A. (2005). *The adult learner: The definitive classic in adult education and human resource development* (6th ed.). Burlington, MA: Elsevier.
- Laiken, M. (1998). *The anatomy of high performing teams: A leader's handbook*. Toronto, Canada: University of Toronto Press.
- Lambert, L. (1998). How to build leadership capacity. *Educational Leadership*, 55(7), 17-19.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York, NY: Cambridge University Press.
- Loss, C. G. (2009). Building, sustaining, and expanding the education doctorate at Peabody College: An administrative view. *Peabody Journal of Education*, 84(1), 44-47.
- Martin, W. M., Murphy, M. J., & Muth, R. (1993). Problem-based learning: A new approach to preparing school leaders. In J. Hoyle & D. Estes (Eds.), *NCPEA: In a new voice* (pp. 141-154). First Annual Yearbook of the National Council of Professors of Educational Administration. Lancaster, PA: Technomic.
- Martyn, M. (2003). The hybrid online model: Good practice. *Educause Quarterly*, 26(1), 18-23.
- McCombs, B. L. (1991). Motivation and lifelong learning. *Educational Psychologist*, 26(2), 117-127.
- McNamara, J., Lara-Alecio, R., Irby, B., Hoyle, J., & Tong, F. (2007, May 22). *Doctoral program issues: Commentary on companion dissertations*. Retrieved from the Connexions Web site: <http://cnx.org/content/m14542/1.1/>
- Merriam, S. B., Caffarella, R., & Baumgartner, L. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco, CA: Jossey-Bass.
- Mezirow, J. (1997, Summer). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education*, 74, 5-12.

- Milstein, M. M. (1992, October–November). *The Danforth Program for the Preparation of School Principals (DPPSP) six years later: What we have learned*. Paper presented at the annual meeting of the University Council for Educational Administration, Minneapolis, MN.
- Muth, R. (2000). Toward a learning-oriented instructional paradigm: Implications for practice. In P. Jenlink & T. Kowalski (Eds.), *Marching into a new millennium: Challenges to educational leadership* (pp. 82-103). Eighth Annual Yearbook of the National Council of Professors of Educational Administration. Lanham, MD: Scarecrow Press.
- Muth, R. (2002). Scholar-practitioner goals, practices, and outcomes: What students and faculty need to know and be able to do. *Scholar-Practitioner Quarterly*, 1(1), 67-87.
- Muth, R., Banks, D., Bonelli, J., Gaddis, B., Napierkowski, H., White, C., Wood, V. (2001). Toward an instructional paradigm: Recasting how faculty work and students learn. In T. J. Kowalski & G. Perreault (Eds.), *Twenty-first century challenges for school administrators* (pp. 29-53). Ninth Annual Yearbook of the National Council of Professors of Educational Administration. Lanham, MD: Scarecrow Press.
- Peel, H. A., Wallace, C., Buckner, K. G., Wrenn, S. L., & Evans, R. (1998). Improving leadership preparation programs through a school, university, and professional organization partnership. *NASSP Bulletin*, 82(602), 26–34.
- Perry, J. A., & Imig, D. G. (2008). A stewardship of practice in education. *The Magazine of Higher Learning*, 40(6), 42-49.
- Phillips, D. C. (Ed.). (2000). *Constructivism in education: Opinions and second opinions on controversial issues*. The 99th Yearbook of the National Society for the Study of Education, Part I. Chicago, IL: University of Chicago Press.
- Rath, T., & Conchie, B. (2008). *Strengths based leadership: Great leaders, teams, and why people follow*. New York, NY: Gallup Press.
- Savery, J. R., & Duffy, T. M. (1995, September-October). Problem-based learning: An instructional model and its constructivist framework. *Educational Technology*, 35(5), 31-38.
- Schmitt, T., & Perl, A. (2007). A solid foundation simplifies the path to leadership. *International Professional Performance Magazine*, 15(1), 26-26.
- Schulman, L. S., Golde, C. M., Bueschel, A. C., & Garbedian, K. J. (2006). Reclaiming education's doctorates: A critique and a proposal. *Educational Researcher*, 35(3), 25-32.
- Scott, W. R., & Davis, G. F. (2006). *Organizations and organizing: Rational, natural, and open system perspectives*. Upper Saddle River, NJ: Pearson.
- Shafritz, J. M., Ott, J. S., & Jang, Y. S. (2004). *Classics of organization theory* (6th ed.). Florence, KY: Wadsworth.

- Wasley, P. (2007, December). Carnegie Foundation creates new "owner's manual" for doctoral programs. *Chronicle of Higher Education*, 54(16), A9.
- Weimer, M. (2002). *Learning-centered teaching: Five key changes to practice*. San Francisco, CA: Jossey-Bass.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identify*. New York, NY: Cambridge University Press.
- Wenger, E., McDermott, R., & Snyder, W. M. (2002). *A guide to managing knowledge: Cultivating communities of practice*. Boston, MA: Harvard Business School Press.
- Wolk, S. (1994, November). Project-based learning: Pursuits with a purpose. *Educational Leadership*, 52(3), 42–45.